I. Amendments

The specification at page 15 lines 10-11 and page 17 line 6 was amended to correct the phrase "where Q, Y, L_1, L_2, and L_3 are selected from structures **I**, **II**, and **III**" to read: "where Q is selected from structures **I** and **II** above, and Y, L_1, L_2, and L_3 are as described for compound **III** above." The revised text is clearly what was intended by the original, typographically erroneous text.

With reference to claim 1, support for the language "*or L_1 is —NRC(=O)$(CH_2)_n$—, —NRC(=O)$(CH_2)_n$C(=O)NH—, or —NR$(CH_2)_n$C(=O)NH$(CH_2)_n$, L_2 is —$(CH_2)_n$O—, and L_3 is —$(CH_2)_n$—, where each n is an integer from 1 to 12*" can be found in original claim 8 and the specification at page 15 lines 1-3, for example. Support for including "*OP$(NR_1R_2)(OR_3)$*" as a possible Z group, "*where R_1 and R_2 are C_1–C_{12} alkyl; C_5–C_{14} aryl; or cycloalkyl containing up to 10 carbon atoms, or when R_1 and R_2 are taken together with the phosphoramidite nitrogen atom, R_1 and R_2 are C_4–C_{11} alkyldiyl, and R_3 is a phosphite ester protecting group*" can be found in the specification at page 17 lines 3-14, for example. No new matter has been added by any of the amendments.

II. Election of Species

Applicant's response submitted May 10, 2002 (filed in the PTO on 5/11/02) was considered to be non-responsive on the grounds that elected species, compound 88, allegedly comprised "a Q moiety which is not disclosed in the elected group." The Examiner requested that the applicant "specifically elect a Q and a[n] X moiety." However, in a telephone conference on August 29, 2002 between the Examiner and Alex Andrus (applicant's prior representative), the Examiner agreed that the elected species was in retrospect adequate.

In particular, the Examiner agreed that the Q moiety in compound 88 is encompassed by claim 1 via the upper Q structures recited in claim 1 and by the language "wherein ... one of the aryl carbons of the diazo structures is the site of attachment to L_1; at least one aryl carbon of each diazo structure is substituted with an electron-withdrawing group and at least one aryl carbon of each diazo structure is substituted with an electron-donating group".

Furthermore, the X moiety in compound 88 is encompassed by claim 1 by the language "or X is an acid-labile protecting group," such as DMT (dimethoxytrityl) (see claim 9 and the specification at page 14 line 20, for example).

Accordingly, claims 1-25 are ready for examination.

PETITION FOR TIME EXTENSION and FEE AUTHORIZATION

A Petition for 2-Month Extension of Time is enclosed herewith. If any additional time extensions are required, such time extensions are hereby requested. If any additional fees not submitted with this response are required, please take such fees from Applied Biosystems Deposit Account No. **01-2213 (Order No. 4584US)**.

Respectfully submitted,

Date: Sept. 24, 2002

Vincent M. Powers
Attorney for Applicants
Reg. No. 36,246

CORRESPONDENCE ADDRESS
Customer Number 22896
Applied Biosystems
850 Lincoln Centre Drive
Foster City, California 94404
TEL: 650-638-6492
FAX: 650-638-6677

Appendix Showing Markup of Changes

Added text is indicated by bold and underlining, deletions by brackets

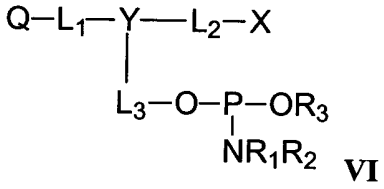
In the Specification

Change the text at page 15 lines 10-11 to read as follows:

where Q is selected from structures **I** and **II** above, and Y, L_1, L_2, and L_3 are as described for compound **III** above [selected from structures **I**, **II**, and **III**]. A may be any cleavable linker, including the structures:

Change the text at page 17 lines 3-18 to read as follows:

Fluorescence quencher compositions of the invention include quencher-phosphoramidites according to the structure **VI**:



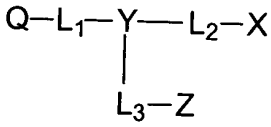
VI

where Q is selected from structures **I** and **II** above, and Y, L_1, L_2, and L_3 are as described for compound **III** above [selected from structures **I**, **II**, and **III**]. Quencher-phosphoramidite reagents **VI** are particularly useful for the automated synthesis of labelled polynucleotides. The phosphoramidite reagents can be nucleosidic (X = nucleoside) or non-nucleosidic, according to structure **VI**, which can effect labelling of a polynucleotide or polypeptide with one or more protected or unprotected quencher moieties, Q. When taken separately, R_1 and R_2 are C_1–C_{12} alkyl such as methyl, ethyl, or isopropyl; C_5–C_{14} aryl; or cycloalkyl containing up to 10 carbon atoms such as, morpholino. When taken together with the phosphoramidite nitrogen atom, R_1 and R_2 may be C_4–C_{11} cycloalkyl, e.g. morpholino. R_3 is a phosphite ester protecting group which prevents unwanted extension of the polynucleotide. Generally, R_3 is stable to polynucleotide or polypeptide synthesis conditions yet is able to be removed from a synthetic polynucleotide product with a reagent that does not adversely affect the integrity of the polynucleotide or the dye. R_3 may be C_1–C_6 alkyl, such as methyl, tert-butyl, or cyanoethyl; C_5–C_{14} aryl, such as phenyl or 2-(4-nitrophenyl)ethyl.

In the Claims

Amend claim 1 to read as follows:

1. (Amended) A fluorescence quencher composition having the structure:



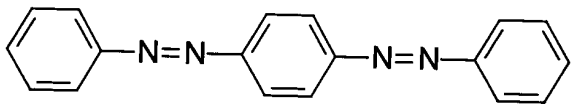
wherein Y is selected from N and CR, where R is H, C_1–C_6 alkyl or C_5–C_{14} aryl;

L_1, L_2, and L_3 are independently selected from a bond, C_1–C_{12} alkyldiyl, C_1–C_{12} alkoxyldiyl, C_1–C_{12} alkylaminodiyl, C_1–C_{12} alkylamidediyl, C_5–C_{14} aryldiyl, and 1-20 ethyleneoxy units; or L_1 is —$NRC(=O)(CH_2)_n$—, —$NRC(=O)(CH_2)_nC(=O)NH$—, or —$NR(CH_2)_nC(=O)NH(CH_2)_n$, L_2 is —$(CH_2)_nO$—, and L_3 is —$(CH_2)_n$—, where each n is an integer from 1 to 12;

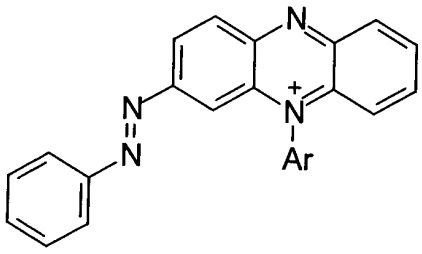
X is an amino acid, a polypeptide, a nucleoside, a nucleotide, a polynucleotide, or a protected form thereof; or X is an acid-labile protecting group;

Z is selected from H, CO_2H, OH, NH_2, NHR, NR_2, SH, $OP(NR_1R_2)(OR_3)$, an ester, a cleavable linker, a solid support, a reactive linking group, and a label selected from a fluorescent dye, a hybridization-stabilizing moiety, a chemiluminescent dye, and an affinity ligand, where R_1 and R_2 are C_1–C_{12} alkyl; C_5–C_{14} aryl; or cycloalkyl containing up to 10 carbon atoms, or when R_1 and R_2 are taken together with the phosphoramidite nitrogen atom, R_1 and R_2 are C_4–C_{11} alkyldiyl, and R_3 is a phosphite ester protecting group; and

Q is selected from the diazo structures:



and



wherein Ar is C_5–C_{14} aryl; one of the aryl carbons of the diazo structures is the site of attachment to L_1; at least one aryl carbon of each diazo structure is substituted with an electron-withdrawing group and at least one aryl carbon of each diazo structure is substituted with an electron-donating group.